



Cholesterol Numbers

- ▶ At age 20 all adults should have their total cholesterol, LDL cholesterol, HDL cholesterol and triglycerides measured.
- ▶ This test is called a **lipid panel** and should be done at least every five years, or more often as directed by a health care provider.
- ▶ Even if your total cholesterol level is not excessively high, the presence of risk factors may justify using treatment to lower your LDL cholesterol and triglycerides and/or raise your HDL cholesterol.

Risk Factors

1. Cigarette smoking
2. High blood pressure (higher than 130/80 or use medication)
3. Low HDL cholesterol (less than 40 mg/dl)
4. Father or brother with heart disease before age 55 or mother or sister with heart disease before age 65*
5. Man older than 45 years or woman older than 55 years.

***Subtract one risk factor if your HDL cholesterol is greater than 60 mg/dl.**

****Heart disease or coronary artery disease may be defined as:**

- Abdominal aortic aneurysm
- Blockage of arteries (in the neck called carotid artery disease; in legs called peripheral artery disease)
- Congestive heart failure
- Heart attack or Stroke
- Sudden Death

Heart Healthy Living:

Physical Activity	Aim for 30-60 minutes per day	Lowers LDL cholesterol and triglycerides. Raises HDL cholesterol.
Smoking	Major risk factor for developing heart disease. Make plans to quit!	Raises Total Cholesterol and lowers HDL cholesterol.
Weight Loss	Risk for heart disease reduced by 5% if weight is reduced by 10 lbs. Maintain a healthy body weight. Aim for a waist measurement that is less than 35 inches for women and 40 inches for men.	Raises HDL cholesterol. Lowers total cholesterol, LDL cholesterol, and triglycerides.

Total Cholesterol

Cholesterol is a waxy substance made by the liver for use throughout our bodies, but too much in the blood stream increases risk of heart disease.

Your level

Desirable	Borderline High	High:
Below 200mg/dl	200-240 mg/dl	Over 240 mg/dl

LDL Cholesterol

LDL cholesterol is called *bad or unhealthy cholesterol*, so low levels are desirable. LDL cholesterol (low density lipoproteins) carries cholesterol to the cells of the body where it is involved in the formation of plaque which can harden and clog arteries. Treatment focuses on lowering LDL cholesterol rather than total cholesterol because it is more clearly linked to heart disease.

Your level

LDL goal	Primary target of therapy
Below 100mg/dl	Heart Disease or Diabetes
Below 130 mg/dl	2 or more risk factors
Below 160 mg/dl	0-1 risk factors

Goal when Triglycerides are over 200

If your Triglycerides are over 200 mg/dl, the LDL can not be accurately measured. A measurement called Non HDL Cholesterol is used. This is calculated by Total Cholesterol – HDL Cholesterol.

Your level

Non HDL goal	Primary target of therapy
Below 130mg/dl	Heart Disease or Diabetes
Below 160 mg/dl	2 or more risk factors
Below 190 mg/dl	0-1 risk factors

HDL Cholesterol

HDL cholesterol is called *healthy cholesterol*, so higher numbers are desirable. HDL cholesterol (high density lipoproteins) carries excess cholesterol away from the cells, back to the liver for removal or recycling. It is often determined by genetics. Among women, the HDL cholesterol levels are better predictors of risk of developing heart disease than total cholesterol level.

Your level

Goal	Risk Factor
60 mg/dl or above	40 mg/dl or less

Cholesterol/HDL ratio

A high total cholesterol to HDL cholesterol ratio (total cholesterol divided by HDL) can be a predictor for developing heart disease, especially if your total cholesterol is normal and your HDL cholesterol is low.

Your level

Goal
3.5 or less

Triglycerides

Triglycerides are blood fats (lipids) that can clog arteries. They are made by your liver and can be affected by family history. Triglycerides can come from too many calories from fat, carbohydrates, and alcohol. High triglycerides cause the LDL to be more plaque forming. **If your fasting triglycerides are above 250 mg/dl, be screened for diabetes.**

Your Level

Goal	Borderline High	High	Very High
Below 150mg/dl	150 - 199mg/dl	200 - 499	500 or higher

Total Daily Fat

60 grams or less for women
75 grams or less for men

Too much total fat in your diet can raise your cholesterol and triglyceride levels.

Fats to Limit:

Saturated and Trans fat raise total cholesterol and LDL cholesterol
Trans fat also lowers HDL cholesterol

1. Saturated Fat

- fatty meats: bacon, sausage, brats, hot dogs
- full fat dairy: cheese, butter, milk, cream, ice cream
- coconut or palm oil
- candy bars, desserts
- fast food: tacos, fried chicken sandwiches, cheeseburgers, french fries, biscuits, pot pies

Recommendations:

15 grams or less per day women
20 grams or less per day men

2. Trans Fat

- bakery goods, doughnuts
- cookies, crackers, snack cakes
- fried foods from restaurants
- partially hydrogenated vegetable oils
- stick margarine, many convenience foods

Recommendations:

Not recommended in any amount.
A label can say “Trans-fat free” but still have trans fat. Look at ingredient list and avoid products that contain “partially hydrogenated fats.”

Point to remember: Even if a product is fried in trans-fat free oil it still may be high in total fat.

Fats to Include in Heart Healthy Eating:

Monounsaturated Fats can lower total cholesterol, triglycerides and LDL
Omega 3 Fat can lower cholesterol and triglycerides

1. Monounsaturated Fat

- olive, canola, peanut oil
- nuts: almonds, hazelnuts, filberts, pistachio, pecans, walnuts, peanuts, mixed nuts
- avocado
- olives
- peanut butter

2. Omega 3 Fat

1. Best source: salmon
2. Good sources: albacore tuna, anchovies, herring, trout, oysters, sardines
3. Fair sources: pollock, sole, cod, perch, crab, haddock, shrimp, scallops

Recommendation:

Aim for 3-5 servings per day.

1 serving = 5 grams fat
1 tsp olive, canola, or peanut oil
2 tsp peanut butter, 5-10 olives,
1/8 avocado, 6-10 nuts

Recommendations:

Choose to eat **6-12 oz** fish weekly to lower heart disease risk.
2000-4000 mg of EPA/DHA (found in fish oil capsules) may lower triglycerides by 30-40%. Discuss with your physician.

Specific foods to help improve your cholesterol numbers:

Soluble Fiber: May lower LDL by 7%

- fruit
- vegetables
- oatmeal
- oat cereals
- flaxseed
- high fiber cereals
- dried beans
- psyllium (Metamucil)

Soy Products: May lower LDL by 4%

- soy nuts
- tofu
- veggie burgers
- soy crumbles
- edamame
- fortified soymilk

Plant Stanols/Sterols

Specially formulated fortified foods that contain plant-based substances that lower LDL cholesterol by 7-15%. 2 grams/day (2000mg) recommended.

Alcohol

May decrease inflammation and raise HDL.
Too much alcohol can raise triglycerides.

Recommendations:

Aim for 10-25 grams soluble fiber daily.
Consume at least 5-9 servings of fruits and vegetables per day.

Recommendations:

26-50 g/day of soy protein per day is the recommended quantity to have an effect on LDL.

1 cup soymilk: 6 g 1/4 cup soynuts: 17 g
1/4 cup tofu: 5 g 2 T soynut butter: 7g

Recommendations: Margarines =

1 1/2 T *Benecol* or *Benecol Light*
2 T *Promise activ™* or *Promise activ™ Light*

Yogurt: *Promise activ™ SuperShots™*

Supplements = "Cholest-off" 4 capsules/day

Also added to other foods in smaller amounts (granola bars, chocolate bars)

Recommendations: If you consume alcohol, keep intake moderate. Women: one drink per day, Men: two drinks per day. Drink defined as 12 oz beer, 5 oz wine, or 1 1/2 oz distilled liquor.

- ◆ If triglycerides are over 500 mg/dl, alcohol should be eliminated

Food and Beverages High in Sugar & Refined Grains

These products may elevate triglycerides

1. Sweets: bars, muffins, cake, donuts, pie, cookies
2. Snack foods: chips, pretzels, crackers, granola bars
3. Condiments: jelly, jam, honey, maple syrup
4. High sugar beverages: soda, fruit juice, energy drinks
5. Refined grains: white bread, white pasta, bagels, cereals

Recommendations: Limit amounts and frequency when consuming these foods.

Cholesterol

The amount of cholesterol in your diet is less important than the total amount of saturated fat and trans fat you consume. Limiting your intake of cholesterol may reduce your LDL by 3-5%.

- Eggs
- Meats
- Organ Meats
- Full-fat dairy (milk, yogurt, cheese)

These foods are often high in saturated fat.

Aim for less than 200-300 mg of cholesterol daily.
Limit eggs to 4 egg yolks per week.

Summary of Recommendations:

To Decrease LDL Cholesterol	pg number	To Decrease Triglycerides & Increase HDL Cholesterol	pg number
Decrease saturated fats. Choose: * Tub margarine instead of butter or stick * Low-fat cheeses (3-5 grams of fat/ounce) * Fat free or 1% milk * Lean meats such as poultry without skin, fish, round/loin cuts of beef/pork Bake, broil or grill meat with minimal added fats.	3	Distribute meals, and the amount of food you eat at each meal, evenly throughout the day. Eat about: 1/3 of your food at breakfast 1/3 at lunch 1/3 for dinner Decrease amount of food if snacks are eaten.	
Eliminate trans fats as much as possible. * Choose trans-fat free tub margarines. * Try to nearly eliminate foods with hydrogenated fats. * Choose trans-fat free varieties of crackers and similar foods as much as possible.	3	Limit use of: ▪ Sweets ▪ Sugary foods ▪ Sweetened beverages, which includes 100% juice ▪ Low-fat sugary products such as frozen yogurt	4
Substitute monounsaturated fats in place of saturated fats.	3	Limit total carbohydrates to 40 – 45 % calories, choosing high fiber carbohydrates such as: • 100% whole wheat breads • whole-grain cereals • fruits • vegetables • dried beans • brown rice	4
Increase exercise.	1		
Consider use of plant sterols or plant stanols.	4		
Significantly increase soluble fiber.	4		
Limit foods high in cholesterol.	4	Substitute monounsaturated fats in place of saturated fats.	3
Include foods high in Vitamins C and E every day.	4	Increase physical activity.	
Maintain a healthy weight.	1	Limit alcohol to: * one drink per day for women * two drinks or less per day for men If triglycerides are over 500, elimination of alcohol might be beneficial.	4
		Lose weight, if applicable: Even a 5% loss (10–15 lbs) helps tremendously.	1
		Include omega 3 fats 2 – 3 times per week.	3
		Stop smoking to increase HDL.	1

Approximate and Cumulative LDL Cholesterol Reduction Achievable By Dietary Modification

Dietary Component	Dietary Change	Approximate LDL Reduction
Major		
Saturated fat	< 7% calories	8 – 10%
Dietary cholesterol	< 200 mg/day	3 – 5 %
Weight reduction	Lose 10 lbs	5 – 8 %
Other LDL-lowering options		
Soluble fiber	5 – 10 g/day	7 %
Plant sterol/stanol esters	2g/day	6 – 15 %
Cumulative estimate		20 – 30 %

Adapted From Jenkins et al.⁷⁶⁸

References

National Cholesterol Education Program Guidelines; American Heart Association